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(54) **METHOD AND SYSTEM FOR MEASURING AND ADJUSTING PRESSURE OF TYRES**
VERFAHREN UND SYSTEM ZUR MESSUNG UND EINSTELLUNG VON REIFENDRUCK
PROCEDE ET SYSTEME DE MESURE ET D'AJUSTEMENT DE LA PRESSION DE
PNEUMATIQUES

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[0017] The system of this invention further comprises an air supplying machine to adjust tyre pressure, taking into consideration the temperature inside the same. This machine has a connection mouth for connection with the tyre valve.

[0018] The air supplying machine has a keyboard, by means of which the nominal pressure value is introduced; a microprocessor adapted to calculate an equivalent pressure, using data from the nominal pressure and the temperature inside the tyre; and a display on which data regarding nominal pressure, present pressure, temperature and equivalent pressure are visualized.

[0019] Said connection mouth for connection with the valve further has means to effect a safe blocking on the valve when said connection mouth is fixed on the same.

[0020] The arrangement of the blocking means is such as to permit the mouth to remain firmly attached to the valve during the operation of pressure adjustment, whereas when the operation is ended, it can be easily unblocked by the user by pulling from an external case of the same. This disposition is made possible due to the use of a generally cylindrical body with longitudinal grooves which allow said body to be subject to perimetral compression, thus reducing its diameter, thereby making possible a firm grip of the same over a valve.

[0021] Furthermore, said air supplying machine optionally incorporates an auxiliary tool which permits to screw or to unscrew the core of the valve if deemed necessary.

[0022] Said tool consists of an essentially cylindrical body which has a cavity at one end, axially disposed to allow the placing of a rod shaped element therein whose free end has a configuration suitable for being coupled to a core. Said tool further has, at the opposite end thereof, another cavity axially arranged, which has a wrench-like configuration which permits the manipulation of valves, end caps or any element related to this field.

[0023] The tyre pressure adjustment is carried out by a pneumatic equipment included within the machine, said equipment being activated either by a control circuit governed by the microprocessor if the user chooses the equivalent pressure calculated by the machine or manually by means of using push buttons (+) and (-), in case that the user prefers to put a pressure different to the calculated one.

[0024] According to the invention, the process of checking the present temperature and pressure of the tyre is carried out by means of a sensor and emitter device attached to the surface of the rim of the tyre which remains inside the tyre, so that in operation conditions, it can directly detect said present pressure and temperature of the tyre.

[0025] The data obtained are subsequently converted into electronic signals which are then converted into radiofrequency waves and are transmitted towards the outside of the tyre.

[0026] Said radiofrequency waves are later received

by a portable receiver set arranged as a remote control apparatus which also serves for switching said receiver and emitter device on.

[0027] Said remote control apparatus further has several push-buttons by means of which the nominal pressure value of the tyre at ambient temperature, which is a value given by the manufacturer, is manually introduced therein; and a display means for displaying values of the nominal pressure, the present temperature and pressure both detected by the sensor device, as well as the equivalent pressure of the tyre which is calculated by a microprocessor included in the remote control apparatus in the same manner as described hereinbefore in the case of the pressure portable tester.

[0028] Once the equivalent pressure which is required for the tyre at the moment of checking is known, the user introduces this data into an air supplying machine with characteristics as mentioned above, in order to adjust the tyre pressure.

[0029] It is to be pointed out that the air supplying mouth would not need the use of contact means to perform the proper reading of the present temperature and pressure inside the tyre.

[0030] The receiver and emitter device essentially consists of at least one thermocouple, a pressure detector, a circuit for reception and emission radiofrequency waves, a circuit for converting radiofrequency waves into electronic signals and vice versa and a power supply circuit which operates by using electronic energy supplying batteries.

[0031] Advantageously the air supplying machine incorporates means for receiving radiofrequency signals emitted from said remote control apparatus in order to detect said signals and process them to obtain data related to the equivalent pressure which has to be supplied to the tyre by the air supplying machine itself.

[0032] For that purpose, said machine may incorporate a radiofrequency waves receiver and a converter for converting radiofrequency waves into electronic signals which are later supplied to the microprocessor incorporated in the air supplying machine.

[0033] In this manner, the user will initially use the remote control apparatus to detect the present temperature and pressure of the tyre, calculate the equivalent pressure to be given to the tyre, and transmit the value thereof to the air supplying machine, which after receiving said value, starts the operation of adjusting the tyre pressure in accordance with the equivalent pressure.

[0034] Optionally, the remote control apparatus may be incorporated in the front panel inside the vehicle where the user can control and check the pressure and the temperature of the tyre without having to get out of the vehicle, or even perform the controlling and checking during the driving.

[0035] In this latter case, the remote control apparatus will effect the measurement of present pressure and temperature of each tyre of vehicle separately and it will visualize them successively, or by according to the se-

base surface (50) with a central orifice through which rod (51) passes. This latter, at the end corresponding to the entry of the tyre valve, has a plane base which rests over the valve core, and at the opposite end it has a cubic or rectangular-prismatic configuration which permits the passage of air and which rests on an end of a spring (52) whose effect is that rod (51) exerts pressure on valve core. On the base surface (50) of the sleeve (49) an elastic joint (53), made of rubber for example, is arranged whose objective is to provide sealing when the valve is introduced into the opening (48) and lays on the joint (53). Additionally the cervoclip (54) arranged in the opening corresponding to outlet tip (42) tends to avoid the inside mechanism of the evolving body (41) from moving out.

[0049] The air supplying machine (3) optionally has an additional tool which permits the threading and unthreading the core of tyre valves.

[0050] Said tool (60), as shown in Figure 7, consists of an essentially cylindric body (61) which has at an end a cavity (62) axially disposed to permit the lodging of a rod shaped utensil (63), whose free end (64) has a suitable configuration to couple on a core. Said rod (63) remains fixed inside the cylindric body (61).

[0051] At its opposite end, tool (60) has another cavity (65) axially disposed which has a first portion (66) with a larger diameter and a keyshaped configuration which permits operation on valves, end caps or any element related to the field of tyres. Said cavity (65) also consists of a second portion (67) intended to allow the introduction of the ends of valves while they are being manipulated by means of the first keyshaped portion (66).

[0052] The machine (3), in the same manner as that of the tester, externally has push-buttons (22) which have specific values assigned thereto corresponding to the pressure values mostly used. Each one of said push-buttons (22) may preferably have a colour specially assigned to its pressure value. By activating the corresponding push-button (22), the nominal pressure value of tyre at environmental temperature as given by the vehicle manufacturer, is introduced into the microprocessor, the microprocessor making the calculation of the pressure equivalent to the nominal depending on temperature. The machine (3) further incorporates two push-buttons (23) which permit to adjust the nominal pressure value in the case where it would not coincide with any push-button (22).

[0053] The microprocessor of the machine is connected to a display (24), on which data regarding nominal pressure, present pressure, equivalent pressure and temperature are displayed; and to a control circuit (25) which controls a pneumatic equipment (26) in charge of adjusting the tyre pressure by introducing or extracting air in and out of the same respectively, by means of the hose (17).

[0054] In this manner, if push-button (22) corresponding to a pre-determined nominal pressure is activated and the mouthpiece (18) is connected to the valve (76),

the microprocessor calculates the equivalent pressure and acts on the pneumatic equipment (26) by means of control circuit (25), adjusting the tyre pressure to the calculated equivalent pressure value.

[0055] Referring to figures 3, 4 and 5 an alternative embodiment of the object of the invention is described, according to which a sensor and emitter device (30) is attached to the surface of a tyre rim (31) so that when said rim carries the corresponding pneumatic tyre (shown in broken lines), said device (30) remains inside the tyre to effect the detection of the present pressure and temperature of tyre.

[0056] Said device (3a), as it can be seen in figure 4, consists of a microprocessor which governs the operation of the same, a radiofrequency wave receiver and emitter, a converter of radiofrequency waves into electronic signals and vice versa, a pressure meter and a thermocouple.

[0057] The remote control apparatus (32) consists of a microprocessor, a display device (DISPLAY), a radiofrequency ; wave receiver and emitter, a converter of radiofrequency waves into electronic signals and vice versa, a supply device, normally a battery, a keyboard (33) and several push-buttons (34) to increase and decrease values shown in the display.

[0058] With this arrangement and in order to carry out the measurement of the present pressure and temperature of tyre, the user uses the keyboard (33) to send the correspondig signal for commanding the sensor and emitter device (30) so that the latter performs the corresponding readings of pressure and temperature.

[0059] As it has been mentioned hereinabove said command is carried out through radiofrequency waves which are transmitted through the transmitter set of the remote control apparatus and which are received by the receiver of the sensor and emitter device (30). Said radiofrequency waves are later converted into electronic signals by means of the converter of said device (30), which are sent to the microprocessor of the same. The latter, having received the corresponding signal, effects the measurement of the pressure by the pressure meter, and of the temperature by the thermocouple of the sensor and emitter device (30). Once the measurements are carried out, the microprocessor sends the signals corresponding to measured data to the converter for their conversion into radiofrequency waves which are emitted towards the outside by the radiofrequency emitter of the sensor and emitter device (30).

[0060] The waves emitted by said device (30) are received by the radiofrequency receiver of the remote control apparatus (32) and once converted into electronic signals by the converter of said apparatus, they are sent to the microprocessor of the same. This latter, according to the received values calculates the equivalent pressure with which the tyre is to be provided. All data related to the present pressure and temperature and nominal pressure can be visualized through the display of the remote control apparatus (32).

ured pressure and temperature values, and displaying said measured pressure and temperature values and said equivalent pressure value,

characterized in that the method comprises the additional steps of:

- commanding by means of radiofrequency waves a sensor and receiver/emitter device (30) located inside the tyre causing the sensor and receiver/emitter device to carry out the measurement of the pressure and temperature inside the tyre from a remote control apparatus (32),
 - transmitting by means of radiofrequency waves, the measured values from the sensor and a sensor and receiver/emitter device (30) to the remote control apparatus (32),
 - transmitting by means of radiofrequency waves, from the remote control apparatus (32) to a pressured air supplying machine (3), either the calculated equivalent pressure value of the nominal pressure, or the measured values of the pressure and temperature inside the tyre, and
 - supplying automatically air to the tyre in order to adjust the tyre equivalent pressure to the nominal pressure given by the manufacturer.
2. Method according to the previous claim, **characterized in that** the pressured air supplying machine (3) calculates the equivalent pressure value to the nominal pressure as a function of the measured temperature and pressure values present in the tyre, by a microprocessor incorporated in the pressured air supplying machine.
3. Method according to the previous claims, **characterized in that** the remote control apparatus (32) calculates the equivalent pressure value to the nominal pressure as a function of the measured temperature and pressure values present in the tyre, by a microprocessor incorporated in the remote control apparatus.
4. Method according to the previous claims, **characterized in that** the nominal pressure value of the tyre at ambient temperature is introduced into the pressured air supplying machine (3) by means of a number of push-buttons (22).
5. Method according to the previous claims, **characterized in that** the nominal pressure value of the tyre at ambient temperature is introduced into the remote control apparatus (32) by means of a number of push-buttons (33).
6. System for carrying out the method of claim 1, of

the type which uses a pressured air supplying machine (3), **characterized in that** it further comprises at least one sensor and receiver/emitter device (30) arranged on a surface of a rim (31) inside a tyre capable of measuring pressure and temperature inside a tyre and receiving and emitting radiofrequency signals in association to at least one remote control apparatus (32) adapted for emitting radiofrequency signals to said sensor and receiver/emitter device (30) causing said sensor and receiver/emitter device to carry out said measurements, and for receiving radiofrequency signals carrying information related to the measured values emitted by the sensor and receiver/emitter device (30); and a device for receiving radiofrequency waves (35) arranged inside said pressured air supplying machine (3) adapted for receiving radiofrequency signals emitted by the remote control apparatus (32) said latter signals carrying information related to the pressure equivalent to the nominal pressure or related to values of temperature and pressure measured inside the tyre.

7. System according to claim 6 **characterized in that** the sensor and receiver/emitter device (30) consists of means for measuring the pressure and the temperature inside the tyre, means for emitting and receiving radiofrequency waves, means for converting radiofrequency waves into electronic signals and vice versa, a microprocessor suitable for governing the operation of the sensor and emitter device and a power supply device, preferably an electric supply battery.
8. System according to claim 6 **characterized in that** the remote control apparatus (32) consists of means for emitting and receiving radiofrequency waves, means for converting radiofrequency waves into electronic signals and vice versa, a microprocessor suitable for governing the operation of the remote control apparatus, means for displaying processed data, a keyboard for introducing pressure values in the remote control apparatus (32) and sending signals for commanding the sensor and receiver/emitter device (30), a series of push-buttons (34) arranged for changing said pressure values and a power supply device, preferably an electric supply battery.
9. System according to claim 6 **characterized in that** the pressured air the supplying machine (3) essentially consists of a microprocessor suitable for governing the operation of the machine, a keyboard (22) for introducing pressure values in said machine (3), a series of push-buttons (23) arranged for changing pressure values in the air supplying machine (3), a pneumatic group for inflating associated to a hose (17) for the passage of air ending at a

air supplying mouthpiece (18) to the tyre valve (75), and to effect the coupling of said mouthpiece to said valve.

Patentansprüche

1. Das Verfahren zum Messen und Regeln des Reifendrucks von Fahrzeugreifen beinhaltet die folgenden Schritte:
 - Messen des Drucks und der Temperatur innerhalb des Reifens, wenn der Reifen Bedingungen von Temperatur und Druck ausgesetzt ist, die sich von den nominalen Werten unterscheiden, wobei letztere sich auf eine als Aussentemperatur definierten Temperatur und einen als Ruhedruck des Reifens definierten Drucks beziehen.
 - Berechnung eines zum nominalen Druck äquivalenten Druckwertes als Funktion von besagtem gemessenen Druck- und Temperaturwerten, sowie Anzeigen besagten gemessenen Druck- und Temperaturwertes und des äquivalenten Druckwertes auf eine solche Art und Weise, dass bei diesem Vorgang folgende Schritte berücksichtigt sind:
 - Steuerung per Funkwellen der Sensor-, Sende- und Empfangseinrichtung (30), die zur Messung des Drucks und der Temperatur im Inneren des Reifens mittels einer ferngesteuerten Kontrolleinrichtung (32),
 - Übermittlung der vom Sensor und Sensor-, Sende- und Empfangseinrichtung (30) gemessenen Werte zur ferngesteuerten Steuerungseinrichtung (32) mittels Funks,
 - Übermittlung mittels Funk des berechneten äquivalenten Druckwertes des nominalen Drucks oder des im Reifeninneren ermittelten Druck- und Temperaturwertes von der ferngesteuerten Steuerungseinrichtung (32) zu einer Druckluftzulieferungseinrichtung (3), sowie
 - die automatische Zuführung von Luft in den Reifen, um eine Einstellung des äquivalenten Druckwertes des, vom Hersteller vorgegeben, Nominaldrucks zu erwirken.
2. Verfahren in Bezug zu vorigem Anspruch, **dadurch gekennzeichnet**, dass die Druckluftzulieferungseinrichtung (3) mittels eines in die Druckluftzulieferungseinrichtung (3) eingebunden Mikroprozessors den äquivalenten Druckwert des Nominaldrucks, in Funktion des ermittelten Temperatur- und Druckwertes, der in dem Reifeninneren vorherrscht, berechnet.
3. Verfahren in Bezug zu den vorigen Ansprüchen, die durch die ferngesteuerte Steuerungseinrichtung (32) charakterisiert ist, welche den äquivalenten Druckwert zum nominal Druck unter Bezugnahme der ermittelten Druck- und Temperaturwerte im Inneren des Reifens mittels eines in die ferngesteuerte Steuerungseinrichtung (32) eingebundenen Mikroprozessors berechnet.
4. Verfahren in Bezug zu den vorigen Ansprüchen, **dadurch gekennzeichnet**, dass der Wert des Nominaldrucks bei Umgebungstemperatur in die Druckluftzulieferungseinrichtung (3) mittels einer Anzahl von Tasten (22) eingegeben werden kann.
5. Verfahren in Bezug zu den den vorherigen Ansprüchen, **dadurch gekennzeichnet**, dass der Wert des Nominaldruckwert des Reifens bei Umgebungstemperatur in die ferngesteuerte Steuerungseinrichtung (32) mittels einer Anzahl von Tasten (22) eingegeben werden kann.
6. System zur Durchführung des Verfahrens von Anspruch 1, das eine Druckluftzulieferungseinrichtung (3) beinhaltet, desweiteren **dadurch gekennzeichnet**, dass es einen Sensor-, Sende- und Empfangseinrichtung (30) beinhaltet, die an der Oberfläche des Randes (31) innerhalb des Reifens so angeordnet ist, dass die Werte des Drucks und der Temperatur im Inneren des Reifens gemessen werden können, wie auch Funksignale von und zu wenigstens einer ferngesteuerten Fernsteuerungseinrichtung (32) empfangen und senden kann, welche zur Übermittlung von Funksignalen zu besagtem Sensor und Sende- und Empfangseinrichtung (30) dient, was bewirkt, dass besagter Sensor und Sende- und Empfangseinrichtung (30) besagte Messungen ausführen, desweiteren Funksignale empfangen, die die Daten zu besagten Messungen beinhalten, gesendet von Sensor und Sende- und Empfangseinrichtung (30); desweiteren eine Einrichtung zum Empfangen von Funksignalen (35), die innerhalb besagter Druckluftzulieferungseinrichtung (3) angebracht sind und für den Empfang von Funksignalen der ferngesteuerten Steuerungseinrichtung (32), wobei besagte Funksignale die Information in Bezug auf den zum Nominaldruck äquivalenten Druck oder in Bezug auf die Werte der Temperatur und des Drucks, im Reifeninneren gemessen, darstellen.
7. System nach Anspruch 6, **dadurch gekennzeichnet**, dass die Sensor-, Sende- und Empfangseinrichtung (30) die Möglichkeit des Messens von Druck und Temperatur im Reifeninneren beinhaltet, Möglichkeiten zum Senden und Empfangen von Funksignalen beinhaltet, Möglichkeiten zum Konvertieren von Funksignalen in elektronische Signale

(47) sich in axialer Richtung nach aussen in eine nicht blockierte Position sich zu bewegen.

20. System nach den vorherigen Ansprüchen, **dadurch gekennzeichnet, dass** die Druckluftzulieferungseinrichtung ein Werkzeug (60) beinhaltet, welches aus einem zylindrischen Körper (61) besteht, der an einem Ende eine axiale Einkerbung (62) aufweist, die das stangenförmige Utensil (63), dessen freies Ende (64) so geformt ist, um in ein Ventil aufgenommen werden zu können, und diese besagte Stange (63) ruht fest innerhalb des besagten zylindrischen Körpers (61); eine andere axial angeordnete Einkerbung (63) hat an dem gegenüberliegenden Ende einen Abschnitt (66) grösseren, schlüssel-förmigen Durchmesser, der zum Einstellen des Ventils geeignet ist, Endverschlüsse und einen zweiten Abschnitt (67), der mit einem kleineren Durchmesser vom ersten Abschnitt (66) das Einlassen des Ventils erlaubt, während sie vom ersten Abschnitt (66) eingestellt werden.
21. System nach den vorherigen Ansprüchen, **dadurch gekennzeichnet, dass** sie Rollen (71) beinhalten, welche die Fähigkeit besitzen in einer synchronisierten Art um ihre entsprechenden axialen Achsen (73) zu rotieren und so angeordnet sind, dass es dem Fahrzeugreifen (72) erlaubt ist an der der gleichen Achse angebracht zu sein und die Rotation besagter Rollen (71) an besagte Räder (72) weiterzugeben, wobei besagte Rollen (71) von einer Steuerungseinrichtung (79), wie zum Beispiel einem elektrischen Motor, gesteuert werden; eine Abstandsdetektionseinrichtung (76), ein Luftzuführungsstück (18) und eine Steuerungseinrichtung (77) sind zur Steuerung des Betriebs der Komponenten des Aufbaus vorgesehen.
22. Aufbau nach Anspruch 21, **dadurch gekennzeichnet, dass** in der Abstandsdetektionseinrichtung (76) zum Erkennen der Position des Reifenventils (75) während der Rotation des Reifens und der Sendung elektronischer Signale des Abstandserkennung des kontrollierten Aufbaus (77) vorgesehen.
23. Aufbau gemäss Anspruchs 21, **dadurch gekennzeichnet, dass** in der Verschiebungseinrichtung (78) der Luftzuführungsstück zum Empfangen von Signalen der Steuerungseinrichtung (77) zum Verschieben des Luftzuführungsstücks (18) zu dem Reifenventil (75) und der Kupplung besagtem Luftzuführungsstücks und besagtem Ventils angepasst ist.

Revendications

1. Procédé et système de mesure et d'ajustement de la pression de pneumatiques qui inclut les étapes suivantes:
 - Mesurer la pression et la température à l'intérieur du pneu quand le pneu est exposé à des températures et des pressions différentes aux valeurs nominales qui correspondent à la température qui se définit comme température ambiante, et à la pression du pneu au repos.
 - Calculer une valeur de pression qui équivaut à la pression nominale en fonction des valeurs de pression et de température mesurées, et indiquer ces valeurs de pression et de température mesurées et la valeur de pression équivalente, **caractérisées** pour une méthode qui comporte les étapes additionnelles suivantes:
 - Commander par des ondes de radiofréquence un capteur et un dispositif de récepteur/émetteur (30) situés à l'intérieur du pneu provoquant que le capteur et le dispositif de récepteur/émetteur effectuent la mesure de la pression et de la température à l'intérieur du pneu, via un appareil de régulation (32).
 - Transmettre d'un capteur et dispositif de récepteur/émetteur (30) à l'appareil de régulation (32) les valeurs mesurées du capteur via des ondes de radiofréquence.
 - Transmettre de l'appareil de régulation (32) à un alimentateur d'air comprimé (3), la valeur de pression mesurée qui équivaut à la pression nominale, ou les valeurs de pression et de température mesurées à l'intérieur du pneu via des ondes de radiofréquence.
 - Gonfler le pneu automatiquement afin de pourvoir le pneu de la pression qui équivaut à la pression nominale donnée par le fabricant.
2. Méthode conforme à la réclamation précédente, **caractérisée** pour l'alimentateur d'air comprimé (3) qui mesure la valeur de pression qui équivaut à la pression nominale en fonction de la température mesurée et les valeurs de pression du pneu, via un microprocesseur incorporé dans l'alimentateur d'air comprimé (3).
3. Méthode conforme aux réclamations précédentes, **caractérisée** pour l'appareil de régulation (32) qui mesure la valeur de pression qui équivaut à la pression nominale en fonction de la température et des valeurs de pression du pneu, via un microprocesseur incorporé dans l'appareil de régulation.

d'échappement (42).

15. Système conforme à la réclamation 14 **caractérisé** pour le corps développé (41) qui possède une section cylindrique d'un diamètre plus longue dont la surface expose une série de nervures. 5
16. Système conforme à la réclamation 14 **caractérisé** pour le corps de bloc (43) qui est construit d'un matériel, de préférence métal, flexible dans la direction radiale. 10
17. Système conforme à la réclamation 14 **caractérisé** pour le corps de bloc (43) qui possède des sections saillantes (47) à l'extrémité libre de chaque section déplaçable (45), et le corps développé (41) qui possède à l'extrémité opposée à la tubelure d'échappement et à la surface interne de celle-là, un collet périmétrique (46) qui coïncide avec les sections saillantes (47) du corps de bloc (43). 20
18. Système conforme à la réclamation 14 **caractérisé** pour le tringle (51) de l'embout de gonflage (18) qui a une configuration cubique ou rectangulaire-prismatique à l'extrémité qui reste à l'intérieur du manchon (49) de cet embout de gonflage (18), et plan d'appui à l'extrémité opposée. 25
19. Système conforme à la réclamation 14 **caractérisé** pour le corps développé (41) qui peut se déplacer sur le corps de bloc (43) jusque qu'à l'insertion des sections saillantes (47) dans le collet périmétrique (46) du support, dû à la tendance des sections saillantes (47) mentionnées de se mouvoir dans une direction radiale à l'extérieur à la position de déblocage. 30 35
20. Système conforme aux réclamations précédentes, **caractérisé** pour l'alimentateur d'air comprimé (3) qui possède des outils (60) qui consistent en un corps cylindrique essentiel (61) qui dispose à l'extrémité d'une cavité (62) à axe pour permettre le déplacement de l'outil en forme de tringle (63) duquel l'extrémité libre (64) possède une configuration apte à être accouplée à un obus de valve, ce tringle (63) reste fixe à l'intérieur du corps cylindrique (61) mentionné; autre cavité (62) à axe déposée sur l'extrémité opposée qui possède une première section (66) avec un diamètre plus large et une configuration en forme de clef apte à manipuler les valves, et les bouchons d'extrémité et ressemblants, et une deuxième section (67), qui est la continuation de la première, avec un diamètre plus petit, qui permet l'introduction des extrémités des valves lorsqu'elles sont manipulées par la première section (66). 40 45 50 55
21. Système conforme aux réclamations précédentes, **caractérisé** pour la composition de rouleaux (71)

qui sont capables de se tourner de manière synchronisée autour de leurs axes (73) et qui permettent que le pneumatique (72) se déplace sur les mêmes pour transmettre la rotation des rouleaux (71) mentionnés au pneumatique (72), ces rouleaux (71) s'opèrent via un mécanisme opérationnel (79) comme un moteur électronique; un dispositif de détection (76) de l'embout de gonflage (18), un équipement pour déplacer (78) cet embout de gonflage (18), et un équipement de contrôle (77) pour diriger l'opération des éléments de construction du système.

22. Système conforme à la réclamation 21 **caractérisé** pour la proximité d'un dispositif de détection qui détecte la position de la valve du pneu (75) lors de la rotation du pneu et pour la transmission de signaux électroniques de détection proches à l'équipement de contrôle.
23. Système conforme à la réclamation 21 **caractérisé** pour l'équipement qui déplace (78) l'embout de gonflage (18) qui s'adapte pour recevoir des signaux de l'équipement de contrôle (77) afin de déplacer l'embout de gonflage (18) à la valve du pneu (75), et l'effet de couplage de cet embout à la valve.

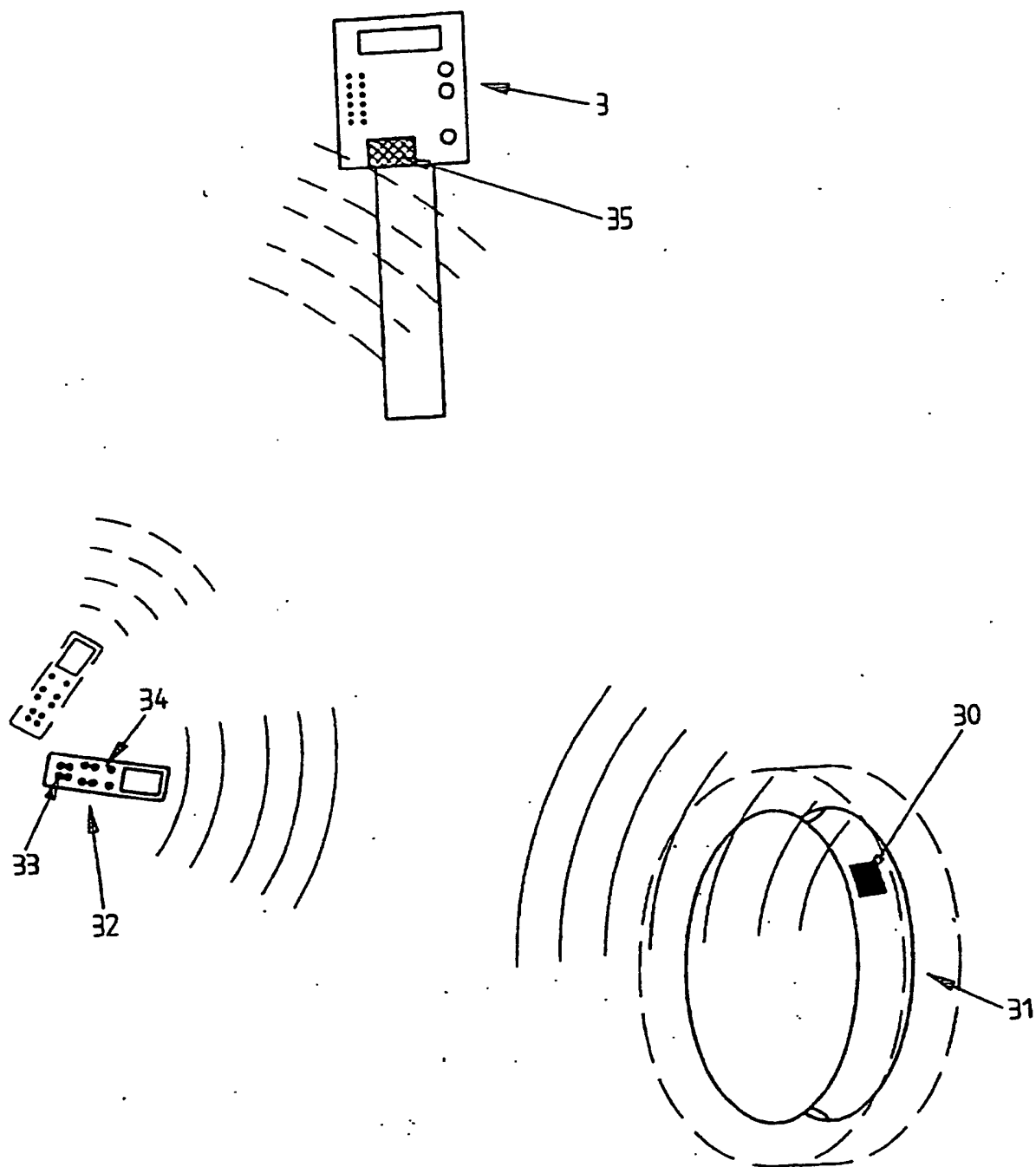


FIG. 3

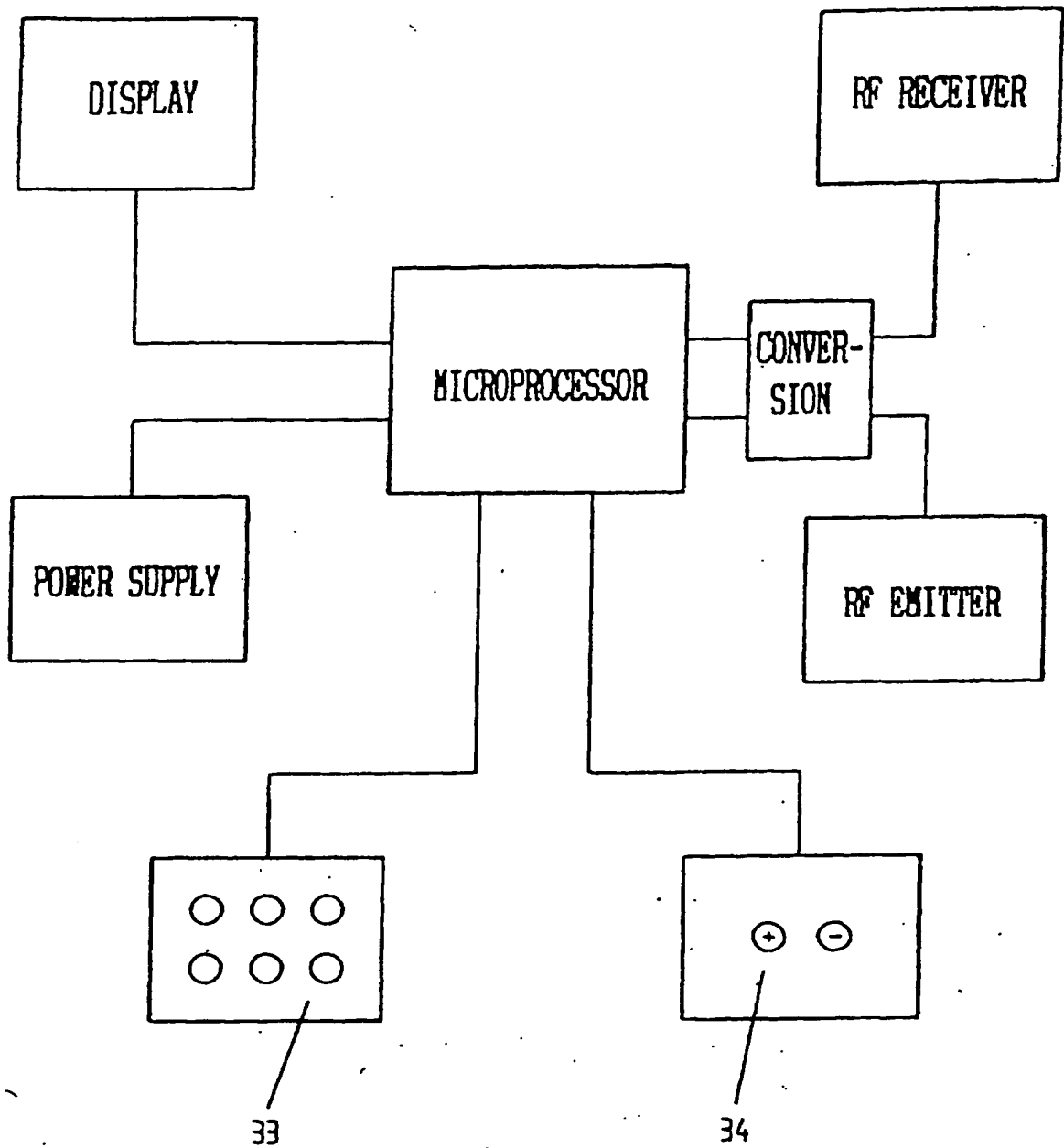


FIG. 5

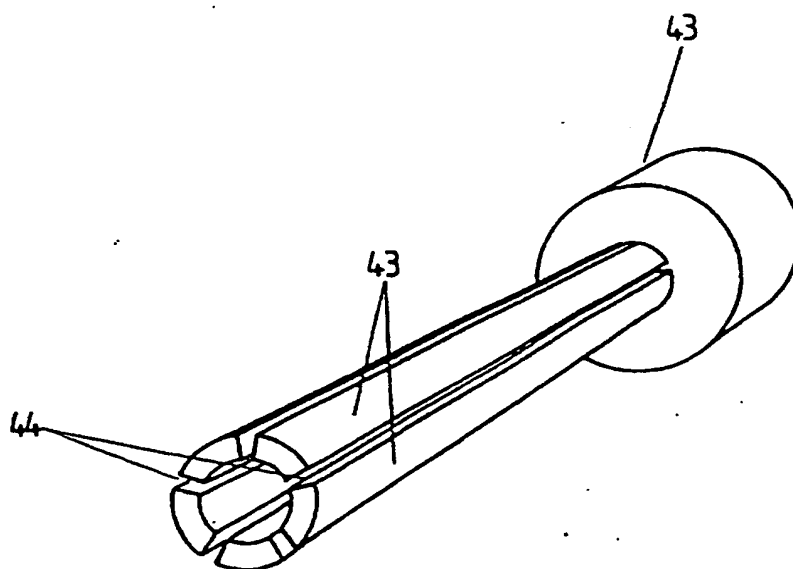


Fig. 6(a)

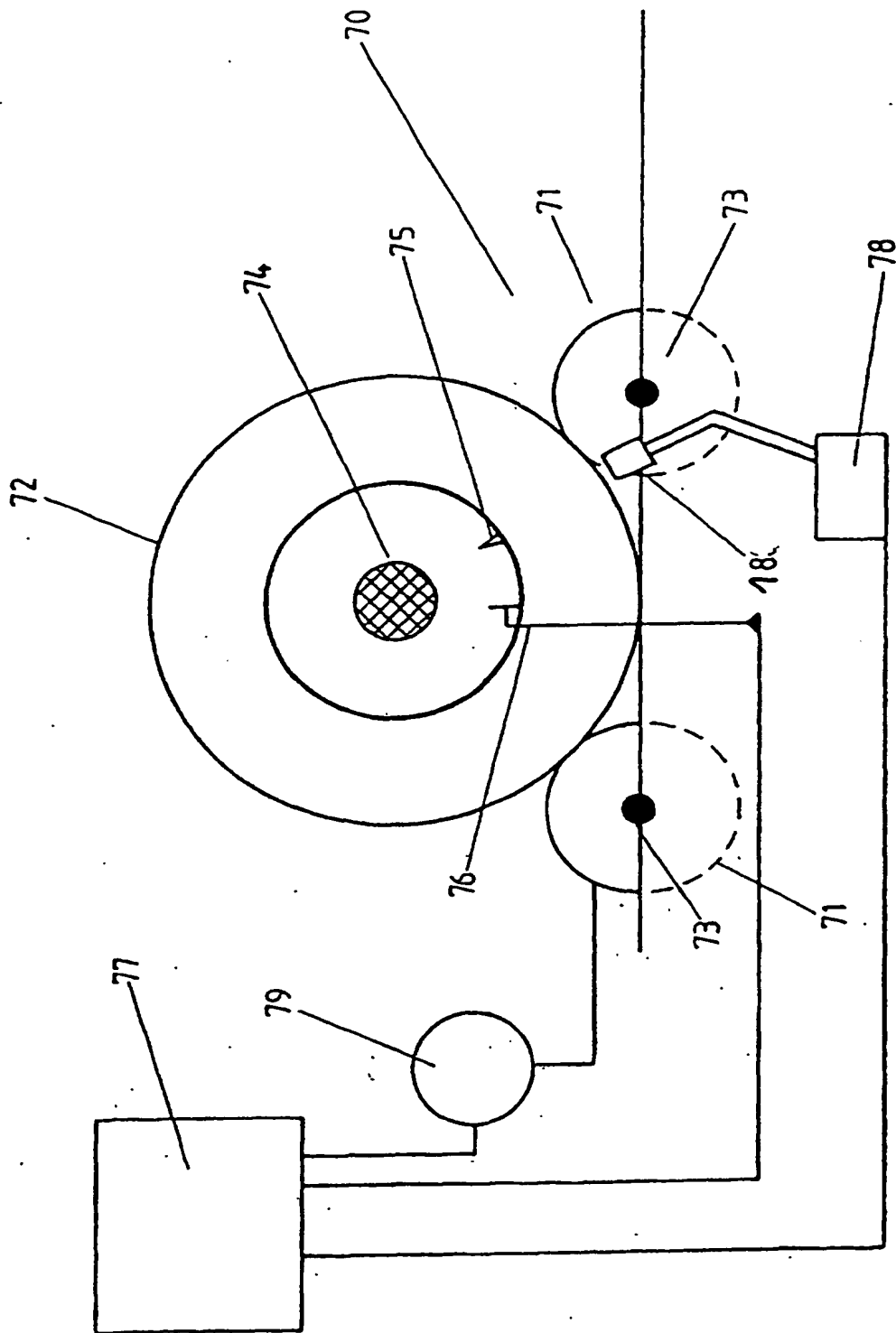


Fig. 8

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